

CLAIMS

1. A rotary assembly comprising a rotatable shaft; a sleeve journaled on the shaft and adapted to be stationary during rotation of the shaft; an earth vector sensor mounted for rotation with the shaft, the earth vector sensor being responsive to a given physical parameter in a direction substantially radial to the shaft; and an orientation signal generator which comprises means for generating a pulse train representing rotation of the shaft relative to the sleeve as a predetermined number of pulses per revolution, and means for deriving from the pulse train and the output of the earth vector sensor the angle between the earth vector and a given position on the sleeve.

2. A downhole assembly adapted to form part of a drill string and comprising a rotary assembly according to claim 1, and in which the earth vector is the component transverse to the drill string axis in the vicinity of the assembly of the earth's local magnetic field or gravitational field.

3. An assembly according to claim 1 or claim 2, in which the means for generating a pulse train comprises a directional sensor arranged radially of the shaft and cooperating with a plurality of elements equispaced around the circumference of the sleeve.



